

Full Length Research Paper

A study on reflection as a source of teacher development: Pre-service and experienced teachers

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This study traces evidence of reflection in teacher education and teaching practice by measuring reflection of preservice teachers and experienced teachers and clarifying reflection-oriented reactions to possible confusions or problematic situations considering whether or not they are reflective practitioners. The data were collected from 514 volunteer preservice teachers and 466 experienced teachers teaching science, math, English, Turkish, and primary classes. Teacher Reflection Scale (TRS) (Kayapinar and Erkus, 2009) was used to collect data. In order to analyze the data and obtain descriptive statistics for the item results, SPSS 16.0 was employed. Statistical analyses gave evidence that preservice primary teachers had a high mean of reflection. Under the light of the results gathered from data, experienced teachers did not attain higher reflection scores when compared to preservice teachers. There is evidence that math teachers' experiences in school settings might lead them to reflect on their practices in time. Experienced teachers of English, science, Turkish, and primary education did not attain higher TRS scores when compared to preservice teachers of the same subject areas. There was no statistically significant and meaningful difference between the rank averages of the mentioned groups' reflection scores. Besides, preservice and experienced primary teachers' reflection scores seem higher than the ones obtained from other subject areas, and there is no significant difference between these two groups. Preservice and experienced math teachers' results demonstrate that the scores of experienced math teachers revealed a statistically significant difference at a meaningful level ($p=.000$).

Key words: Reflection, preservice, teacher, teaching, teacher development.

INTRODUCTION

Reflection can be defined as “an active, persistent, and careful consideration of any belief or supposed form of knowledge in light of the grounds supporting it and future conclusions, to which it tends” (Dewey, 1933: 43).

Zeichner (1994) believes that reflection is essential for bringing understanding to the complex nature of classrooms, and states that teachers should be trained to reflect on the subject matter and the thoughtful application

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of particular teaching strategies. He further states that teachers need to reflect on their learners' thinking, understandings, interests and developmental thinking. In other words, teachers need to look at teaching from other perspectives to become more reflective practitioners.

Reflection is to be aware of what we are doing. According to Rowntree (1992), reflection is studying one's own study methods as seriously as one studies the subject and thinking about a learning task after you have done it. Moreover, reflection is a key concept and essential for teachers since it makes teachers aware of what they are doing and how well they teach. Reflection, also, increases critical thinking (Korthagen, 2004), provides a source of knowledge construction in teaching (Conway, 2001), and promotes self-regulation in teachers (Boud, 2000).

According to Wenzlaff (1994), the more teacher reflectivity occurs, the better the quality of education is (cited in Tok and Doğan-Dolapçioğlu, 2013). Al-Issa (2002: 44) states "reflection enables teachers and student teachers to diagnose and understand their classroom contexts and students' learning better, put their students' learning at the heart of the teaching-learning process, develop a rationale for their teaching, and take informed specific actions and make sound decisions in the classroom". Wilson and Jan (1993) describe reflection as a process of individual's evaluation of self, experience, and learning. Reflection is also claimed as a goal in many teacher preparation programs, but its definition and how it might be fostered in student teachers are problematic issues. Four key issues with regard to reflection emerge from Dewey's original work and its subsequent interpretation. The first is whether reflection is limited to thought process about action, or is more inextricably bound up in action (Grant and Zeichner, 1984; Noffke and Brennan, 1988). The second relates to the time frames within which reflection takes place, and whether it is relatively immediate and short term, or rather more extended and systematic, as Dewey (1933) seems to imply (Schön, 1983). The third has to do with whether reflection is by its very nature problem-centered or not (Adler, 1991; Calderhead, 1989; Schön, 1987). Finally, the fourth is concerned with how consciously the one reflecting takes account of wider historic, cultural, and political values or beliefs in framing and reframing practical problems to which solutions are being sought, a process which has been identified as "critical reflection" (Gore and Zeichner, 1991; Smyth, 1989). In relation to reflective thinking versus reflective action, there seems to be wide agreement that reflection is a special form of thought (Sparks-Langer and Colton, 1991; Waxman et al., 1988). But Dewey himself also spoke of reflective action presumably addressing the implementation of solutions once problems have been thought through, and it is clear

that most writers are concerned with the complete cycle of professional doing coupled with reflection which then leads to modified action (Noffke and Brennan, 1988). It may be useful to contrast this cyclical idea with routine action, which derives from impulse, tradition, or authority. Reflective action is bound up with persistent and careful consideration of practice in the light of knowledge and beliefs, showing attitudes of open-mindedness, responsibility, and wholeheartedness (Noffke and Brennan, 1988).

Reflection is, in this sense, a beneficial practice to support professional development of teachers and their efforts to improve students' learning (Fendler, 2003; Hoffman et al., 2003). "The reflective practice movement involves a recognition that teachers should be active in formulating the purposes and ends of their work" (Zeichner and Liston, 1996: 5). As Zeichner and Liston (1996) indicate, a reflective teacher makes the effort to solve the challenges of classroom instruction and takes responsibility for his or her own professional development. According to Bengtsson (1995), reflective teaching encourages teachers to create a distance between themselves and their practices. Therefore, teachers find themselves in a questioning process of their practices which will lead to professional development.

Moreover, reflective teaching is a consideration of thought, a process of disciplined intellectual criticism combining research; knowledge of context, and balanced judgment about previous, present, and future actions, events or decisions (Minott, 2009). Therefore, reflective teaching is an approach to teaching, learning, and problem solving that uses reflection as a main tool (Minott, 2009). Reflective teaching is an active, consistent, and careful way of thinking (Dewey, 1957); directly relevant and meaningful to Schön's (1987) construct of "reflection-in-action"

There are many studies, as follows, which contributed to the field of reflective teaching and practices such as the prevalence of reflective teaching practices (Tok and Doğan-Dolapçioğlu, 2013), preservice teachers' reflective thinking tendencies (Poyraz and Usta, 2013), the evidences and the promotion of teacher reflection (Mena et al., 2010), understanding the perceptions of the ELT student teachers and their trainers (Al-Issa and Al-Bulushi, 2010), ELT preservice teachers' teacher reflection both at the beginnings of practicum and through the end of it (Yaman and Armutçu, 2010), preservice English teachers' reflections on their teaching performance (Akcan, 2010), a standard reflection scale to help elementary and secondary school teachers with their classroom activities and professional growth, expatriate reflective practitioners (Kayapınar, 2013), a self-study (Williams, 2008), reflective teachers' development and use of self-directed critical thinking and ongoing critical inquiry in their practice (Calderhead,

1992; Cole, 1997), and identifying personal meaning and/or significance of a classroom or school situation, and this would include the disclosure and examination of personal feelings (Reiman, 1999). Preservice teachers theorize about their practices cognitively and affectively by gaining insights into the complexities of the teaching and learning process and of themselves as teachers (Ditchburn, 2015).

Kayapınar and Erkuş (2009) point out that reflection is an attribute which can be gained by experience, and it can be developed via education and experience although it is a process of self-observation and self-evaluation. Besides, teacher reflection refers to spontaneous critical scrutiny of teachers' thoughts and behavior in terms of teaching and learning including their' beliefs and knowledge as well as practice and effects elicited by those beliefs and knowledge (Sung et al., 2009). In this respect, this study tries to reveal preservice and experienced teachers' thoughts and behavior in terms of reflective teaching and makes a comparison between the two groups. Therefore, the purpose of this study is to measure reflection of preservice teachers (freshman-senior) and experienced teachers in school and classroom settings and to clarify their reflection-oriented reactions to possible confusions or problematic situations in teaching environments by using quantitative data considering whether or not they are reflective practitioners. The study also tries to find out any possible significant differences between reflective behavior of the two groups using total reflection scores of preservice teachers and experienced teachers. In this way, any existing evidence of reflective teaching practice in different subject areas will also be revealed.

METHOD

Participants

Preservice teachers

The study group of preservice teachers, randomly chosen from volunteers (with a consent statement approved under the authority of the university) in different departments of the same college of education in Turkey, comprised 514 volunteer preservice teachers who were studying different majors including science, math, primary, English language, and Turkish language at a four-year undergraduate level. The data for preservice teachers were available for 85 science preservice teachers (50 freshmen-Year 1, 35 seniors-Year 4), 121 primary preservice teachers (53 freshmen-Year 1, 68 seniors-Year 4), 80 math preservice teachers (49 freshmen-Year 1, 31 seniors-Year 4), 100 English language preservice teachers (36 freshmen-Year 1, 64 seniors-Year 4), and 128 Turkish language preservice teachers (54 freshmen-Year 1, 74 seniors-Year 4) in total.

Experienced teachers

The study group of experienced teachers comprised 466

volunteers teaching at curricula of Ministry of National Education in different fields including science, math, primary education, English, and Turkish; they were randomly chosen from different schools in Turkey. They averaged 14 years of teaching experience. None of them possessed post graduate degrees. The data were available for 82 science teachers, 104 primary teachers, 91 math teachers, 96 English language teachers, and 93 teachers.

Data collection

Teacher Reflection Scale (Kayapınar, 2013; Kayapınar and Erkuş, 2009) was employed to capture participants' reflective responses in different settings. Teacher Reflection Scale is a standardized scale which was developed in order to measure teacher reflection including 22 items. It covers two settings of problematic scenarios which are reflection for classroom settings (RCS) and reflection for colleagues and management settings (RCMS) (see below for sample items). The respondents are asked to choose the best option referring to their reaction/s when they face such problematic situations in the teaching environment from the given scenarios as seen in the following items:

Sample items for RCS:

Item15. One of your students distracts the others:

- a. I intervene.
- b. Everyone is responsible for himself.
- c. I make him sit down in the front alone.

Sample item for RCMS:

Item 21. The management do not consider the teachers' opinions:

- a. I often express my annoyance about it.
- b. I don't want to deal with that.
- c. I wonder if we are partly responsible.

Considering the validity of the scale, the internal consistency coefficient of the scale was reported as 0.868. In addition, the reliability of the scale was reported as 0.835. Moreover, the correlation between RCS scores and RCMS scores is .634 ($p < 0.01$). The correlation between RCS/RCMS scores and the total scores is .953 for RCS and .838 for RCMS. The correlation coefficients between total sub-scale scores and total scale scores prove that the scale may be used and commented as a whole and/or as independent parts for determining reflection levels according to the settings. Further examinations demonstrated that the reflection scores do not differ according to gender ($t = 1.494$; $df = 130$; $p > 0.05$) and subject areas, math and social sciences ($t = 1.881$; $df = 126$; $p > 0.05$).

Data analyses

Apart from descriptive statistics, validity, and reliability of the scale, because the population of participants did not seem to meet the requirements of normal distribution, a nonparametric correlation technique called Mann-Whitney U Test was used to compare the reflection scores of Year 1 and Year 4 preservice teachers and reflection scores of preservice teachers and experienced teachers and to investigate the relationship between RCS and RCMS scores. As the participants included more than 30 subjects, the z-approximation was also calculated. In order to analyze the data and obtain descriptive statistics for the item results, SPSS 16.0 was employed.

Table 1. Preservice and experienced science teachers' reflection.

Pre-service Year 1-Year 4				Pre-service total and experienced				
Group		N	Mean rank	Sum of ranks	Group	N	Mean rank	Sum of ranks
Reflection	Year 4	35	55.41	1939.50	Pre.	85	79.01	6716.00
	Year 1	50	34.31	1715.50	Exp.	82	89.17	7312.00
	Total	85			Total	167		

Table 2. Preservice and experienced science teachers' scale statistics.

	Preservice Year 1-Year 4	Preservice Total and Experienced
	Reflection	Reflection
Mann-Whitney U	440.500	3.061E3
Wilcoxon W	1.716E3	6.716E3
Z	-3.895	-1.361
Asymp. Sig. (2-tailed)	0.000	0.173

a. Grouping Variable: Preservice Science teachers b. Grouping Variable: Preservice and experienced Science teachers

Table 3. Preservice science teachers' reflection in classroom settings.

Group		N	Mean Rank	Sum of Ranks
Reflection	Year 4	35	56.21	1967.50
	Year 1	50	33.75	1687.50
	Total	85		

FINDINGS

Statistical results of the study were presented in tables, ranks, scale statistics, and reports to interpret the results of the research. Table 1 present the data on the calculated z-values and the approximately calculated statistical significance of differences between the reflection scores.

Table 1 gives valuable information about preservice science teachers' reflection because it indicates which group can be considered as having the higher mean rank, namely, the group with the highest reflection scores. In this case, the mean score of Year 4 group is 55.41 and the group had higher reflection scores. Still, the mean scores do not seem sufficient for preservice teachers to be reflective. In this sense, they can be called partly reflective.

The rank average of experienced teachers' reflection scores was 89.17, while the scores of preservice teachers had a rank average of 79.01. The rank averages of the scores of experienced teachers and preservice teachers indicate that the rank average of

experienced teachers' reflection scores is higher than the one that preservice teachers had.

From this data, reflection in Year 4 is statistically significantly higher than Year 1 ($U = 440.500$, $Z = -3.895$, $p = .000$). In other words, Mann-Whitney U Test showed that Year 4 might have elicited a statistically significant change in preservice science teachers' reflective behaviour in favor of Year 4. Considering the results, there might be a positive change in reflective behaviour of preservice teachers. Still, this might be insufficient when the mean scores are taken into consideration.

Table 2 reveals that the results of Mann-Whitney U test for preservice math teachers' scores and experienced math teachers' scores did not show any statistical difference ($Z = .518$; $p = .604 > .05$) although the rank average of experienced science teachers' reflection scores is higher than preservice science teachers'. In other words, it can be stated that reflection in Year 4 is statistically not significantly higher than Year 1 ($U = 3.061E3$, $Z = -1.361$, $p = .173$).

Table 3 indicates the group with the highest mean rank has the higher reflection scores in classroom settings. In this case, Year 4 had the highest reflection scores in classroom settings.

An examination of the findings shows that the results of the Mann-Whitney U test applied to the reflection scores of the students in Year 4 and Year 1 revealed a statistically significant difference. It can be inferred that Year 4 students' reflection in classroom settings is statistically significantly higher than Year 1 ($U = 412.500$, $Z = -4.161$, $p = 0.000$). Based on these results,

Table 4. Preservice science teachers' RCS sub-scale statistics.

Parameter	Reflection
Mann-Whitney U	412.500
Wilcoxon W	1687.500
Z	-4.161
Asymp. Sig. (2-tailed)	0.000

Grouping Variable: Preservice Science teachers.

Table 5. Preservice science teachers' reflection in colleagues and management settings.

Group	N	Mean rank	Sum of ranks
Reflection	Year 4	35	51.04
	Year 1	50	37.37
	Total	85	

Table 6. Preservice science teachers' RCMS sub-scale statistics.

Parameter	Reflection
Mann-Whitney U	593.500
Wilcoxon W	1868.500
Z	-2.586
Asymp. Sig. (2-tailed)	0.010

Grouping Variable: Preservice Science teachers.

an implication can be stated as the curriculum or learning environment might be prompting for reflective practice in classroom teaching settings indirectly (Table 4).

Table 5 is very useful because it indicates which group can be considered as having the higher reflection scores in colleagues and management settings, overall; namely, the group with the highest mean rank. In this case, Year 4 had the highest reflection scores in colleagues and management settings. However, when the mean scores are examined, it can be stated that there is no such practice to emphasize reflection in colleagues and management settings in the curriculum.

Table 6 presents data on the calculated z-value and the approximately calculated statistical significance of differences between Year 4 and Year 1 students. The results have shown that a Mann-Whitney U Test showed that Year 4 might have revealed a statistically significant change in preservice teachers' reflective behaviour in colleagues and management settings. It can be concluded that reflection in Year 4 is statistically significantly

higher than Year 1 ($U = 593.500, Z = -2.586, p = 0.010$). Still, an inference can be made that there is no emphasis on reflection in colleagues and management settings in the curriculum on purpose.

Table 7 indicates which group can be considered as having the higher mean rank; in other words, the group with the highest reflection scores. In this case, Year 4 scored 76.84 in average and had the highest reflection scores. The mean scores indicate that there is a meaningful difference in reflection scores. This might mean that preservice primary teachers are not aware of reflective practice consciously or subconsciously in their first year of education. However, the learning environment gives them a considerable amount of awareness directly or indirectly until they reach Year 4.

The rank average of experienced teachers' reflection scores was 112.74, while the scores of preservice teachers had a rank average of 114.16. The rank averages of the scores of experienced teachers and preservice teachers indicate that they had somewhat similar reflection levels.

From this data, it can be concluded that reflection in Year 4 is statistically significantly higher than Year 1 ($U = 725.000, Z = -5.648, p = 0.000$). The Mann-Whitney U test showed that Year 4 might have elicited a statistically significant change in preservice teachers' reflective behaviour. The mean score of Year 4 preservice teachers seem pretty high and meaningful when total scale scores are taken into consideration.

Table 8 reveals that the results of Mann-Whitney U test for preservice math teachers' scores and experienced math teachers' scores did not show any statistical difference ($Z = 0.518; p = 0.604 > 0.05$). In other words, it can be stated that reflection in Year 4 is statistically not significantly higher than Year 1 ($U = 6273.000, Z = -.163, p = 0.871$).

Table 9 indicates Year 4 had higher reflection scores in classroom settings. This might mean that Year 4 students think more reflectively in classroom practices. The score is slightly higher for Year 4 preservice teachers in classroom settings whereas the score stays almost the same for Year 1 preservice teachers. This result supports the results of the total scale scores.

The findings in Table 10 show that the results of the Mann-Whitney U test applied to the reflection scores of the students in Year 4 and Year 1 revealed a statistically significant difference. It can be inferred that the level of Year 4 students' reflection in classroom practices is statistically significantly higher than Year 1 ($U = 708.000, Z = -5.750, p = 0.000$). From the results for classroom practices, learning environment and/or the curriculum applications might be helpful for preservice teachers to be more reflective.

Table 11 indicates Year 4 students can be considered as having considerably the higher reflection scores in colleagues and management settings. It might be

Table 7. Preservice and experienced primary teachers' reflection.

Preservice Year 1-Year 4				Preservice Total and Experienced				
Group		N	Mean Rank	Sum of Ranks	Group	N	Mean Rank	Sum of Ranks
Reflection	Year 4	68	76.84	5225.00	Pre.	121	114.16	13813.00
	Year 1	53	40.68	2156.00	Exp.	105	112.74	11838.00
	Total	121			Total	226		

Table 8. Preservice and experienced primary teachers' scale statistics.

Parameter	Preservice year 1-Year 4		Preservice total and Experienced	
		Reflection		Reflection
Mann-Whitney U		725.000		6273.000
Wilcoxon W		2156.000		1.184E4
Z		-5.648		-.163
Asymp. Sig. (2-tailed)		0.000		0.871
	a. Grouping Variable: Preservice Primary teachers		b. Grouping Variable: Preservice and experienced Primary teachers	

Table 9. Preservice primary teachers' reflection in classroom settings.

Group		N	Mean Rank	Sum of Ranks
Reflection	Year 4	68	77.09	5242.00
	Year 1	53	40.36	2139.00
	Total	121		

Table 12. Preservice primary teachers' RCMS sub-scale statistics.

Parameter	Reflection
Mann-Whitney U	1128.500
Wilcoxon W	2559.500
Z	-3.636
Asymp. Sig. (2-tailed)	0.000

Grouping Variable: Preservice primary teachers.

Table 10. Preservice primary teachers' RCS sub-scale statistics.

	Reflection
Mann-Whitney U	708.000
Wilcoxon W	2139.000
Z	-5.750
Asymp. Sig. (2-tailed)	0.000

Grouping Variable: Preservice primary teachers.

Table 11. Preservice primary teachers' reflection in colleagues and management settings.

Group		N	Mean rank	Sum of ranks
Reflection	Year 4	68	70.90	4821.50
	Year 1	53	48.29	2559.50
	Total	121		

inferred that they look into possible problematic situations at collegial or management level more

reflectively.

Table 12 presents data which were on the calculated z-value and the approximately calculated statistical significance of differences between Year 4 and Year 1 students. It can be concluded that reflection in Year 4 is statistically significantly higher than Year 1 ($U = 1128.500$, $Z = -3.636$, $p = 0.000$). This might refer to the idea that curriculum applications or the learning environment until Year 4 might have revealed a statistically significant change in preservice teachers' reflective behaviour in colleagues and management settings.

The rank average of reflection scores of Year 4 was 37.34, while the scores in Year 1 had a rank average of 42.50. The rank averages of the scores of Year 4 and Year 1 indicate that they had somewhat similar and very low reflection levels. The mean scores might mean that there is reflective practice or any curriculum applications leading to reflection or reflective behaviour in math education (Table 13).

The rank average of experienced teachers' reflection

Table 13. Preservice and experienced math teachers' reflection.

Preservice Year 1-Year 4				Preservice Total and Experienced				
Group		N	Mean Rank	Sum of Ranks	Group	N	Mean Rank	Sum of Ranks
Reflection	Year 4	31	37.34	1157.50	Pre.	80	53.33	4266.50
	Year 1	49	42.50	2082.50	Exp.	56	90.17	5049.50
	Total	80			Total	136		

Table 14. Preservice and experienced math teachers' scale statistics.

Parameter	Preservice year 1-Year 4		Preservice total and experienced	
		Reflection		Reflection
Mann-Whitney U		661.500		1026.500
Wilcoxon W		1157.500		4266.500
Z		-.971		-5.379
Asymp. Sig. (2-tailed)		0.331		0.000
	a. Grouping Variable: Preservice math teachers		b. Grouping Variable: Preservice and experienced math teachers	

Table 15. Preservice math teachers' reflection in classroom settings.

Group		N	Mean rank	Sum of ranks
Reflection	Year 4	31	35.97	1115.00
	Year 1	49	43.37	2125.00
	Total	80		

Table 16. Preservice math teachers' RCS sub-scale statistics.

Parameter	Reflection
Mann-Whitney U	619.000
Wilcoxon W	1115.000
Z	-1.394
Asymp. Sig. (2-tailed)	0.163

Grouping Variable: Preservice math teachers.

scores was 90.17, while the scores of preservice teachers had a rank average of 53.33. The rank averages of the scores of experienced teachers and preservice teachers indicate that they had somewhat similar reflection levels. The table indicates the group with the highest mean rank has the higher reflection scores. In this case, experienced teachers obviously had higher reflection scores.

Table 14 reveals that the results of Mann-Whitney U test for preservice math teachers' scores in Year 4 and Year 1 did not show any statistical difference ($Z=0.971$; $p=0.331>.05$). In other words, it can be stated that reflection in Year 4 is not statistically significantly higher than Year 1 ($U = 661.500$, $Z = -.971$, $p = 0.331$). The results support the idea that preservice math teachers do not achieve any reflective behaviour during their education of math teaching.

Table 14 reveals that the results of Mann-Whitney U test for preservice math teachers' scores and experienced math teachers' scores did elicit a considerable statistical difference ($Z=-5.379$; $p=0.000$). In other words, it can be stated that experienced teachers' reflection is statistically significantly higher than preservice teachers ($U = 1026.500$, $Z = -5.379$, $p =$

0.000).

Table 15 indicates the group with the highest mean rank has no higher reflection scores in classroom settings. In this case, Year 4 did not have a significant difference in reflection scores in classroom settings. This might be a cumulative result of a variety of factors including curriculum itself or curriculum applications during math teaching education.

An examination of the findings shows that the results of the Mann-Whitney U test applied to the reflection scores of the students in Year 4 and Year 1 did not reveal a statistically significant difference. It can be inferred that reflection of Year 4 students in classroom settings is statistically significantly not higher than Year 1 ($U = 619.000$, $Z = -1.394$, $p = .163$). The results might refer to a gap between reflective practice and the math teaching curriculum (Table 16).

Table 17 indicates Year 4 did not have higher reflection scores in colleagues and management settings than reflection scores of Year 1. Similarly, there is no indication reflective practice in colleagues and

Table 17. Preservice math teachers' reflection in colleagues and management settings.

Group	N	Mean rank	Sum of ranks
Year 4	31	42.74	1325.00
Reflection Year 1	49	39.08	1915.00
Total	80		

Table 18. Preservice math teachers' RCMS sub-scale statistics.

Parameter	Reflection
Mann-Whitney U	690.000
Wilcoxon W	1915.000
Z	-0.729
Asymp. Sig. (2-tailed)	0.466

Grouping Variable: Preservice math teachers

management settings for preservice math teachers.

Table 18 presents data on the calculated z-value and the approximately calculated statistical significance of differences between Year 4 and Year 1 students. The legend of the table shows that reflection in Year 4 is not statistically higher than Year 1 ($U = 690.000$, $Z = -.729$, $p = .466$). The results have shown that A Mann-Whitney U Test showed that Year 4 might have not revealed a statistically significant change in preservice teachers' reflective behaviour in colleagues and management settings.

The table gives valuable information because it indicates which group can be considered as having the higher mean rank, namely, the group with the highest reflection scores. In this case, Year 4 had the higher reflection scores. Still, the scores show that there might not be a reflection-oriented practice of English teaching education during the process.

The rank average of experienced teachers' reflection scores was 100.64, while the scores of preservice teachers had a rank average of 96.45. The rank averages of the scores of experienced teachers and preservice teachers indicate that they had somewhat similar reflection levels. The mean scores do not show a huge difference between preservice teachers and experienced teachers. Table 19 gives the statistical analysis of the results.

From this data, it can be concluded that reflection in Year 4 is statistically significantly higher than Year 1 ($U = 816.000$, $Z = -2.422$, $p = .015$). In other words, Mann-Whitney U Test showed that Year 4 might have elicited a statistically significant change in preservice English teachers' reflective behaviour, which might still not be sufficient (55.75) for an effective reflective

practice.

Table 20 reveals that the results of Mann-Whitney U test for preservice English teachers' scores and experienced English teachers' scores did not show any statistical difference ($Z = -.518$; $p = .604 > .05$). In other words, it can be stated that experienced English teachers' reflection is not statistically and significantly higher than preservice English teachers' reflection ($U = 4.595E3$, $Z = -.518$, $p = .604$). This might mean that in professional life, teachers' reflective behaviour do not change significantly in a positive way.

Table 21 indicates the group with the highest mean rank has the higher reflection scores in classroom settings. In this case, Year 4 had the highest reflection scores in classroom settings. However, the mean score is pretty low to state a reflective behaviour is being practiced during the education of English teaching.

The findings might not be a proof of reflective behaviour which is directly taught when the mean scores are taken into consideration. Still, the results of the Mann-Whitney U test applied to the reflection scores of the students in Year 4 and Year 1 revealed a statistically significant difference (Table 22). It can be inferred that reflection of Year 4 students in classroom settings is statistically significantly higher than Year 1 ($U = 826.500$, $Z = -2.350$, $p = .019$).

Table 23 indicates the group with the highest reflection scores is Year 4. Again, the mean scores for both groups of preservice teachers are pretty low even though a slight increase is seen for Year 4 preservice English teachers.

Table 24 presents data on the calculated z-value and the approximately calculated statistical significance of differences between Year 4 and Year 1 students. The legend of the table shows that reflection in Year 4 is not statistically higher than Year 1 ($U = 1020.000$, $Z = -.984$, $p = .325$). The results based on Mann-Whitney U Test showed that Year 4 might have not revealed a statistically significant change in preservice teachers' reflective behaviour in colleagues and management settings although the mean rank of Year 4 preservice teachers' scores is higher than Year 1 preservice teachers. This might mean that preservice teachers of English are not educated throughout their university life as reflective practitioners and/or there is no application or prompts referring to reflective practice in the higher education English teaching curriculum.

The rank average of reflection scores of Year 4 was 65.03, while the scores in Year 1 had a rank average of 63.78. The rank averages of the scores of Year 4 and Year 1 indicate that they had somewhat similar reflection levels. Preservice Turkish language teachers' mean scores seem slightly higher than preservice English language and Math teachers' mean scores. Additionally, the mean scores between Year 1 and Year 4 preservice teachers seem close to each other.

Table 19. Preservice and experienced English language teachers' reflection.

Preservice Year 1-Year 4				Preservice Total and Experienced				
Group		N	Mean Rank	Sum of Ranks	Group	N	Mean Rank	Sum of Ranks
Reflection	Year 4	64	55.75	3568.00	Pre.	100	96.45	9645.00
	Year 1	36	41.17	1482.00	Exp.	96	100.64	9661.00
	Total	100			Total	196		

Table 20. Preservice and experienced English language teachers' scale statistics.

Parameter	Preservice Year 1-Year 4		Preservice Total and Experienced	
	Reflection		Reflection	
Mann-Whitney U	816.000		4.595E3	
Wilcoxon W	1.482E3		9.645E3	
Z	-2.422		-0.518	
Asymp. Sig. (2-tailed)	0.015		0.604	
	a. Grouping Variable: Preservice English language teachers		b. Grouping Variable: Preservice and experienced English language teachers	

Table 21. Preservice English teachers' reflection in classroom settings.

Group		N	Mean Rank	Sum of Ranks
Reflection	Year 4	64	55.59	3557.50
	Year 1	36	41.46	1492.50
	Total	100		

Table 24. Preservice English teachers' RCMS sub-scale statistics.

Parameter	Reflection
Mann-Whitney U	1020.000
Wilcoxon W	1686.000
Z	-0.984
Asymp. Sig. (2-tailed)	0.325

Grouping Variable: Preservice English teachers.

Table 22. Preservice English teachers' RCS sub-scale statistics.

Parameter	Reflection
Mann-Whitney U	826.500
Wilcoxon W	1492.500
Z	-2.350
Asymp. Sig. (2-tailed)	.019

Grouping Variable: Preservice English teachers.

Table 23. Preservice English teachers' reflection in colleagues and management settings.

Group		N	Mean Rank	Sum of Ranks
Reflection	Year 4	64	52.56	3364
	Year 1	36	46.83	1686
	Total	100		

The rank average of experienced teachers' reflection scores was 111.94, while the scores of preservice teachers had a rank average of 111.18. The rank

averages of the scores of experienced teachers and preservice teachers indicate that they had similar reflection levels (Table 25).

Table 26 reveals that the results of Mann-Whitney U test for preservice Turkish language teachers' scores in Year 4 and Year 1 did not show any statistical difference ($Z = .189$; $p = .850 > .05$). In other words, it can be stated that reflection in Year 4 is statistically not significantly higher than Year 1 ($U = 1.959E3$, $Z = -.189$, $p = .850$). As might be inferred from the mean scores, the scores indicate that there is no or little evidence of applications through reflective practice or behaviour in higher education Turkish language teaching curriculum.

Table 26 reveals that the results of Mann-Whitney U test for preservice math teachers' scores in Year 4 and Year 1 did not show any statistical difference ($Z = .087$; $p = .931 > .05$). In other words, it can be stated that reflection in Year 4 is statistically not significantly higher than Year 1 ($U = 5.575E3$, $Z = -.087$, $p = .931$).

Table 27 indicates that the mean scores for classroom settings are very similar to the ones for total reflection

Table 25. Preservice and experienced Turkish language teachers' reflection.

Preservice Year 1-Year 4				Preservice Total and Experienced				
Group		N	Mean Rank	Sum of Ranks	Group	N	Mean Rank	Sum of Ranks
Reflection	Year 4	74	65.03	4812.00	Pre.	128	111.18	14231.00
	Year 1	54	63.78	3444.00	Exp.	94	111.94	10522.00
	Total	128			Total	222		

Table 26. Preservice and experienced English language teachers' scale statistics.

Parameter	Preservice year 1-Year 4		Preservice total and experienced	
	Reflection		Reflection	
Mann-Whitney U	1.959E3		5.575E3	
Wilcoxon W	3444E3		1.423E4	
Z	-.189		-.087	
Asymp. Sig. (2-tailed)	0.850		0.931	
	a. Grouping Variable: Preservice Turkish language teachers		b. Grouping Variable: Preservice and experienced Turkish language teachers	

Table 27. Preservice Turkish teachers' reflection in classroom settings.

Group		N	Mean Rank	Sum of Ranks
Reflection	Year 4	74	65.58	4853.00
	Year 1	54	63.02	3403.00
	Total	128		

Table 28. Preservice Turkish teachers' RCS sub-scale statistics.

Parameter	Reflection
Mann-Whitney U	1918.000
Wilcoxon W	3403.000
Z	-.388
Asymp. Sig. (2-tailed)	.698

Grouping Variable: Preservice Turkish teachers.

Table 29. Pre-service Turkish teachers' reflection in colleagues and management settings.

Group		N	Mean Rank	Sum of Ranks
Reflection	Year 4	74	63.75	4717.50
	Year 1	54	65.53	3538.050
	Total	128		

scores. They show that the group with the highest mean rank has no higher reflection scores in classroom settings. In this case, Year 4 did not have a significant

difference in reflection scores in classroom settings. This result supports the idea that there is no or little evidence of applications through reflective practice or behaviour in higher education Turkish teaching curriculum.

It can be inferred that reflection of Year 4 students in classroom settings is statistically significantly not higher than Year 1 ($U = 1918.000$, $Z = -.388$, $p = .698$). An examination of the findings shows that the results of the Mann-Whitney U test applied to the reflection scores of the students in Year 4 and Year 1 did not reveal a statistically significant difference. This result also proves that there is no change in reflective behaviour of preservice Turkish teachers (Table 28).

Table 29 indicates Year 4 did not have higher reflection scores in colleagues and management settings than reflection scores of Year 1. An inference might be made on higher education curriculum that the curriculum does not focus on any settings of colleagues and management.

Table 30 presents data on the calculated z-value and the approximately calculated statistical significance of differences between Year 4 and Year 1 students. The legend of the table shows that reflection in Year 4 is not

Table 30. Pre-service Turkish teachers' RCMS sub-scale statistics.

Parameter	Reflection
Mann-Whitney U	1942.500
Wilcoxon W	4717.500
Z	-.274
Asymp. Sig. (2-tailed)	.784

Grouping Variable: Preservice Turkish teachers

statistically higher than Year 1 ($U = 1942.500$, $Z = -0.274$, $p = 0.784$). The results based on Mann-Whitney U Test showed that Year 4 might have not revealed a statistically significant change in preservice teachers' reflective behaviour in colleague and management settings.

The comparisons made between Year 1 and Year 4 preservice teachers lead the way to see evidence of reflective behaviour in actual teaching practices after graduation. A comparison between preservice teachers and experienced teachers would be an indicative of reflective practice, which might be developed in natural teaching environments of teaching with the help of the nature of teaching environments and other extraneous almost no indication of reflective teaching in higher education practices. In order to see evidence of reflective practice, a comparison between preservice and experienced teachers' scores could be found in the following tables based on the subject areas. It can be seen that the total scores were analyzed and the comparisons between the total scores were made and examined for the study. Reflection scores for classroom settings and reflection scores for colleague and management settings were not included in analyses because of the data loss.

Conclusion

The findings and results give interesting evidence that experienced teachers of English language, science, Turkish language, and primary education did not attain higher reflection when compared to preservice teachers of the same subject areas. There was no statistically significant and meaningful difference between the rank averages of the mentioned groups' reflection scores. This result might mean that -putting aside all uncontrollable variables, extraneous factors, or external and environmental forces- experienced teachers of English language science, Turkish language, and primary education do not reflect on their practices, or their level of reflection does not show any significant difference in time. This might be due to the nature of the teacher education programs in Turkey, addressing the

ongoing discussion/s about the constituents of teacher education process. Teacher education institutions should employ reflective practices; the teacher candidates should be guided on how to reflect on their experiences-simply with Schön's construct of "reflection-in-action" (Schön, 1983).

Next, preservice and experienced primary teachers' reflection scores seem higher than the ones from other subject areas (mean=112.74 for preservice teachers and 114.16 for experienced teachers), and there is no significant difference between these two groups. This might mean that these two groups keep their reflective attitude and practice reflection-oriented teaching in time. Preservice and experienced math teachers' results demonstrate that the scores of experienced math teachers revealed a statistically significant difference at a meaningful level ($p=000$). This result might mean that math teachers' experiences in classroom settings and colleague, and management settings might lead them to develop reflective skills in their practices in time even if the mean score of preservice math teachers' reflection seems too low (mean=37.34) while experienced teachers of English, science, Turkish, and primary education do not reflect on their practices, or their level of reflection does not show any significant difference in time.

Further studies might be held on reflection for larger samples in an experimental design to produce more knowledge on reflection, the effect of reflective teaching, and the change in teacher behavior and/or beliefs. This might lead decision makers to conclusive long-term organizational decisions on putting reflection and reflective teaching into curricula of undergraduate studies and disciplines of teacher education.

Conflict of interests

The author has not declared any conflicts of interest.

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